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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/811,300	03/26/2004	Alessandro Pizzochero	3525.1003-002	8258
21005	7590	08/05/2005	EXAMINER	
HAMILTON, BROOK, SMITH & REYNOLDS, P.C. 530 VIRGINIA ROAD P.O. BOX 9133 CONCORD, MA 01742-9133			CUEVAS, PEDRO J	
			ART UNIT	PAPER NUMBER
			2834	

DATE MAILED: 08/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/811,300	<b>Applicant(s)</b> PIZZOCHERO ET AL.	
	<b>Examiner</b> Pedro J. Cuevas	<b>Art Unit</b> 2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 26 March 2004.  
 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.  
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
 6) ☒ Claim(s) 1-29 is/are rejected.  
 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
 10) ☒ The drawing(s) filed on 03 January 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☐ All    b) ☐ Some \* c) ☐ None of:  
         1. ☐ Certified copies of the priority documents have been received.  
         2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
         3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
     \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>11/03/04</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 9 and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
3. Claim 9 recites the limitation “the other buffer” in line 2, and “the buffers” in line 3. It is not clear to which buffer the claim is referring to, the first of the second.
4. Claim 13 recites the limitation “the circuit” in line 1. There is insufficient antecedent basis for this limitation in the claim.

### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-2, 4, 6-7, 15-17, and 19-20 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,656,882 A to Lazarus et al. (prior art document submitted by applicant).

Lazarus et al. clearly teaches the construction of a packaged strain actuator, comprising:

a transducer (12) that generates electrical energy under dynamic mechanical loading, including stress, and is manufactured through a lamination process;

a laminar buffer (110 - bottom), which can be more (column 5, lines 48-58) or less (column 5, lines 59-65) stiffer than a local stiffness of a structure (20), mechanically coupled by surface bonding (column 4, lines 44-48) to the transducer, the buffer facilitating the transducer to operate within a predetermined mechanical loading range to allow the electrical power generation system to generate the electrical energy and defining two ends, at least one of the ends (bottom) attached to the structure; and

a second laminar metal buffer (110 - top) coupled to the transducer separate from the other buffer, and forming a seal (elements 110 + 120) around the transducer.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 3, 5, 8-10, 14, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,656,882 A to Lazarus et al. (prior art document submitted by applicant) in view of U.S. Patent No. 5,305,507 A to Dvorsky et al. (prior art document submitted by applicant).

Lazarus et al. disclose the construction of a packaged strain actuator as disclosed above.

However, it fails to disclose:

an electrically conductive pattern electrically coupled to the transducer and disposed on a film in different layers in a layered relationship with the transducer, the electrically conductive pattern collecting electrical energy generated by the transducer;

a second buffer encapsulating the transducer with the other buffer, the electrically conductive pattern including contacts exposed external from buffers; and

an energy harvesting circuit electrically coupled to the electrically conductive pattern and disposed in different layers of a layered relationship with the transducer.

Dvorsky et al. teach the construction of a method for encapsulating a ceramic device, comprising:

an electrically conductive pattern (12, 14) electrically coupled to the transducer and disposed on a film in different layers in a layered relationship with the transducer (Figure 1), the electrically conductive pattern collecting electrical energy generated by the transducer; and

a second buffer (20) encapsulating (surrounding) transducer(s) (10) having electrically conductive pattern contacts (16, 18) exposed external from buffer (Figure 2); for the purpose of converting energy in a predetermined frequency range to electric energy; for the purpose of embedding the device in composite structures.

It would have been obvious to one skilled in the art at the time the invention was made to use the electrically conductive pattern and buffer arrangement disclosed by Dvorsky et al. on the packaged strain actuator disclosed by Lazarus et al. for the purpose of embedding the device in composite structures.

9. With regards to claims 3 and 5, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use:

a composite, metal, fiber, or polymer to make a stiffer buffer; or

a rubber, foam, plastic, or composite to make a less stiff buffer;

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since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice.

*In re Leshin*, 125 USPQ 416.

10. Claims 11-13, and 21-29 rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,656,882 A to Lazarus et al. (prior art document submitted by applicant) in view of U.S. Patent No. 5,305,507 A to Dvorsky et al. (prior art document submitted by applicant) as applied to claims 3, 5, 8-10, 14, and 18 above, and further in view of U.S. Patent No. 4,467,236 to Kolm et al.

Lazarus et al. in view of Dvorsky et al. disclose the construction of a packaged strain actuator as disclosed above, and having circuits and transducers on the same layer (column 3, line 52 to column 4, line 9).

However, it fails to disclose:

an energy harvesting circuit electrically coupled to the electrically conductive pattern and disposed in different layers of a layered relationship with the transducer;

a planar housing enclosing the transducer and circuit, the housing allowing the transducer to be exposed to the dynamic motion conditions and providing electrical contacts coupled to the circuit output to facilitate delivery of the usable electricity for external circuitry.

Kolm et al. teach the construction of a piezoelectric acousto-electric generator comprising:

an energy harvesting circuit (Figure 2) electrically coupled to the electrically conductive pattern and disposed in different layers of a layered relationship with the transducer; and

a planar (Figure 4) housing (12) enclosing the transducer and circuit, the housing allowing the transducer to be exposed to the dynamic motion conditions and providing electrical contacts coupled to the circuit output to facilitate delivery of the usable electricity for external circuitry;

for the purpose of converting energy in a predetermined frequency range to electric energy.

It would have been obvious to one skilled in the art at the time the invention was made to use the energy harvesting circuit and housing disclosed by Kolm et al. on the a packaged strain actuator disclosed by Lazarus et al. in view of Dvorsky et al. for the purpose of converting energy in a predetermined frequency range to electric energy.

### ***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See PTO-892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pedro J. Cuevas whose telephone number is (571) 272-2021. The examiner can normally be reached on M-F from 8:30 - 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on (571) 272-2044. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Pedro J. Cuevas  
July 27, 2005



BURTON S. MULLINS  
PRIMARY EXAMINER